Extension of Jeffreys's prior estimate for Weibull censored data using Lindley's approximation

ABSTRACT

The Weibull distribution has attracted the attention of statisticians working on theory and methods as well as in various fields of applied statistics. In this paper the Jeffreys's and extension Jeffreys's priors with the squared loss function are considered in the estimation. The Bayesian estimates of the scale and shape parameters of the Weibull distribution obtained using Lindley's approximation are then compared to its maximum likelihood counterparts. The comparison criteria is the mean square error (MSE) and the performance of these two estimates are assessed using simulation considering various sample size, several specific values of Weibull parameters and several values of extension Jeffreys's prior. The Maximum Likelihood estimates of ɗ and p are more efficient than their Bayesian using Jeffreys's prior and extension of Jeffreys's prior, but the extension of Jeffreys's is better than maximum likelihood for some conditions.

Keyword: Extension of Jeffrey's prior information; Weibull distribution; Bayesian method; Right censoring; Lindley's approximation